4th (AC)³ Science Conference on Arctic Amplification

February 23 – 26, 2026

Institute of Geophysics and Meteorology, University of Cologne, Lecture room (Pohligstr. 3, 50969 Köln), Germany

Agenda

MONDAY, 23 February 2026

13:00	Registration
13:30 – 14:30	**Welcome & Intro**
13:30 – 13:40	Welcome – *Susanne Crewell (Uni Cologne)*
13:40 – 14:30	Opening & Status of the project – *Manfred Wendisch (Uni Leipzig)*
14:30 – 15:00	*coffee break*
15:00 – 16:50	**Session Highlights – Mixed-phase Clouds**
	Session Chairs: Hannah Sundermann (TROPOS) & André Ehrlich (Uni Leipzig)
15:00 – 15:30	Keynote talk: "Arctic mixed-phase clouds: Processes, implications, and questions" – *Matthew Shupe (University of Colorado)*
15:30 – 15:50	"Multi-Spectral Retrieval of Cloud Phase and Water Path, Validated Using Active Satellite Measurements" – *Alexander Mchedlishvili et al. (Uni Bremen)*
15:50 – 16:10	"Surface-coupling effects on Arctic mixed-phase clouds during MOSAiC" – *Hannes Griesche et al. (TROPOS)*
16:10 – 16:30	"Confronting resolved turbulence in Large-Eddy Simulations of Arctic mixed-phase clouds with aerial system data collected during the MOSAiC drift" – *Xinyuan Zhou et al. (Uni Cologne)*
16:30 – 16:50	"Flying into the Cold: The NSF Cold-Air outbreak Experiment in the Sub-ARctic (CAESAR)" – *Paquita Zuidema et al. (University of Miami)*

16:50 – 17:05	"The Polar Radiant Energy in the Far-InfraRed Experiment (PREFIRE): Overview, First Results, and Next Steps" – *Tristan L'Ecuyer (University of Wisconsin-Madison)*
18:00 – 22:00	**Finger food & Evening Talk**
19:00	Evening Talk: "Inhabiting liquescence: how circumpolar people live with arctic amplification" - *Franz Krause (University of Cologne, Department of Social and Cultural Anthropology)*

<u>Tuesday, 24 February 2026</u>

09:00 – 10:30	**Session Highlights – Aerosols** *Session chairs: Linus Andrae (University of Bremen) & Kathy Law (LATMOS/IPSL-CNRS, Sorbonne Université)*
09:00 – 09:30	Keynote talk: "40 Years of Arctic Aerosol Research at the University of Stockholm, Highlights and Open Questions" – *Jost Heintzenberg (TROPOS)*
09:30 – 09:50	"Effect of Aerosols on Cloud Phase during Atmospheric River Events" – *Fathima Cherichi Purayil et al. (Leipzig University)*
09:50 – 10:10	"Transport of smoke from boreal wildfires to the Arctic" – *Swetlana Paul et al. (TROPOS)*
10:10 – 10:30	"Creation and Validation of an Aerosol Optical Depth Time Series of Pan-Arctic Scale" – *Linus Andrae & Neha Mehendale et al. (University of Bremen)*
10:30 – 11:00	*coffee break*
11:00 – 12:20	**Session Strategic Questions (SQ) – SQ1: What are the main drivers and relative contributions to Arctic Amplification?** *Session Chairs: Lena Bruder (University of Cologne) & Dörthe Handorf (AWI Potsdam)*
11:00 – 11:20	"The effect of improved turbulence parametrization in ICON-NWP on simulations of Arctic winter stable-boundary layers" – *Florian Gebhardt et al. (AWI Potsdam)*
11:20 – 11:40	"A Python-based package to compute climate storylines applied to arctic-midlatitude linkages" – *Richard Alawode et al. (Leipzig University)*
11:40 – 12:00	"Evaluation of the ICON Sea Ice Albedo Parametrization against Arctic observations" – *Josien Rompelberg et al. (AWI Potsdam)*
12:00 – 12:20	Plenum discussion
12:30 – 14:00	*Lunch break*

14:00 – 17:00	**Poster session I – Mixed-phase clouds & Sea Ice (see poster list)**
Including	*coffee break*
17:00 – 18:00	**Breakout session** (parallel) CCA1 "Convection" – *Johannes Quaas (Leipzig University)* CCA4 „Air mass transport & transformation" – *Sofie Tiedeck (AWI Potsdam)*

Wednesday, 25 February 2026

09:00 – 10:30	**Session Highlights – Sea Ice** *Session Chairs: Maximilian Ringel (University of Bremen) & Janna Rückert (University of Bremen)*
09:00 – 09:30	Keynote talk: "A new ice fracture model based on thin elastic plate theory" – *Bruno Tremblay (McGill)*
09:30 – 09:50	"Arctic Ocean Heat Transport and Mixing" – *Khaled Al Hajjar et al. (Leipzig University)*
09:50 – 10:10	"Sea ice deformation: A dynamics view of Arctic sea ice and its interaction with the climate system" – *Linxin Zhang et al. (University of Bremen)*
10:10 – 10:30	"Retrieving Arctic Summer Sea Ice Thickness below Melt Ponds from Hyperspectral Optical Measurements" – *Maximilian Ringel et al. (University of Bremen)*
10:30 – 11:00	*coffee break*
11:00 – 12:30	**Session Strategic Questions – SQ2: How do meridional transport change affect Arctic and midlatitude climate?** *Session Chairs: Awadhesh Pant (University of Cologne) & Susanne Crewell (University of Cologne)*
11:00 – 11:30	Keynote talk: "Characterizing High-Latitude Precipitation Phase During Atmospheric River Events" – *Claire Pettersen (University of Michigan)*
11:30 – 11:50	"Quantifying the temporal variability of water vapor in Ny-Ålesund and its relation to weather systems" – *Christian Buhren et al. (University of Cologne)*
11:50 – 12:10	"Diagnosing moisture sources, transport and transformation in the Arctic with water vapor isotopes in atmospheric modeling" – *Hannah Marie Eichholz et al. (Leipzig University)*
12:10 – 12:30	Plenum discussion
12:30 – 13:30	*Lunch break*

13:30 – 16:30	**Poster session II – Aerosols, SQ1, SQ2 & SQ3 (see poster list)**
Including	*coffee break*
17:30	**Social event** (reservation required) Deutsches Sport & Olympia Museum (Im Zollhafen 1, 50678 Köln) Guided Tour & Team Event
19:30	**Dinner** (reservation required) Dom im Stapelhaus (Frankenwerft 35, 50667 Köln)

Thursday, 26 February 2026

09:00 – 10:30	**Session Strategic Questions – SQ3: What trends from Arctic Amplification are observable, and how will they evolve in a warmer climate?** *Session Chairs: Sophie Vliegen (Leipzig University) & Sandro Dahlke (AWI Potsdam)*
09:00 – 09:30	Keynote talk: "Arctic change, the polar vortex, winter weather and extremes" – *Judah Cohen (Massachusetts Institute of Technology)*
09:30 – 09:50	"Arctic cyclones: Impacts on sea ice and future changes" – *Lars Aue et al. (AWI Potsdam)*
09:50 – 10:10	"How Well Do CMIP6 Models Capture Northern Hemisphere Circulation Patterns? A Data-Driven Analysis" – *Abdellah Bizdaz et al. (Leipzig University)*
10:10 – 10:30	Plenum discussion
10:30 – 11:00	*coffee break*
11:00 – 12:00	**Breakout session** (parallel) CCA2 "Surface parametrizations" – *Evi Jäkel (Leipzig University)* CCA3 "Arctic mixed-phase clouds" – *Vera Schemann (University of Cologne)*
12:00 – 12:30	**Wrap up** – *Manfred Wendisch (Leipzig University)*
12:30	**End of conference**

(AC)³ is going to cover the finger foods on Monday, dinner, non-alcoholic drinks and Social Event on Wednesday, as well as all coffee and lunch breaks during the conference via the central project Z01. Childcare is covered via the (AC)³ equal opportunity funds.

Poster Session I - Mixed-phase clouds & Sea Ice

#1 "Assessment of Circulation Weather Types around Svalbard and their Impact on the Ny-Ålesund atmospheric column" – *Philip Eisenhuth et al. (AWI Potsdam)*

#2 "Arctic Cloud Regimes and Their Radiative Effect Based on MOSAiC Observations" – *Hartwig Deneke (TROPOS)*

#3 "Evaluation of summertime Arctic surface cloud radiative effect derived from satellite products against aircraft observations during NASA ARCSIX" – *Sebastian Becker et al. (University of Cologne)*

#4 "Impacts of mesoscale subsidence on glaciation and decoupling in Arctic marine cold air outbreaks" – *Fiona Paulus et al. (University of Cologne)*

#5 "Quantifying the Evolution of Cloud Street Structures During Arctic Marine Cold Air Outbreaks Using Satellite Observations" – *Hannah Sundermann et al. (TROPOS)*

#6 "Cloud state transitions at Ny-Ålesund: A machine learning supported statistical analysis" – *Andreas Walbröl (University of Cologne)*

#7 "An assessment of water vapor entrainment fluxes under specific humidity inversions using a year of LES data for the MOSAiC drift" – *Patrick Zobec et al. (University of Cologne)*

#8 "VAMPIRE dataset - Arctic clouds, water vapor and sea ice emissivity" – *Linnu Bühler (University of Cologne)*

#9 "Exploring Aerosol-Cloud Interactions in Arctic Mixed-Phase Clouds Using ICON-LEM" – *Lena Bruder et al. (University of Cologne)*

#10 "IOP4H2O: Investigating the Arctic water cycle in highresolution observations and modeling" – *Sabrina Schnitt et al. (University of Cologne)*

#11 "Doppler Velocity Derivation and EarthCARE CPR Assessment based on the COMPEX-EC Arctic Airborne Campaign" – *Lars van Gelder et al. (University of Cologne)*

#12 "Investigation of water vapor isotopes during an atmospheric river event using model data and satellite retrievals" – *Angel Ignatious et al. (University of Bremen)*

#13 "Investigation of precipitation sublimation and evaporation with active remote sensing in Ny-Ålesund" – *Andreas Foth et al. (Leipzig University)*

#14 "Retrieving Capacitance and Ventilation Factor Using Observations of Sublimating Snowfall" – *Beril Aydin et al. (Leipzig University)*

#15 "Evaluating the snow microwave radiative transfer model SMRT over sea ice for atmospheric sounding frequency channels: Comparison to in-situ data from three Arctic ship" – *Janna Rückert et al. (University of Bremen)*

#16 "Contrasting Optical Properties in Different Sea Ice Regimes" – *Florian Zimmer et al. (AWI Bremerhaven)*

#17 "Improving and validating the TROPOMI tropospheric BrO retrieval in the Arctic" – *Bianca Zilker et al. (University of Bremen)*

#18 "The effect of surface heterogeneity on the Arctic surface energy budget: From low-level airborne in-situ observations to satellite retrievals" – *Joshua Müller et al. (Leipzig University)*

#19 "Recent improvements of the surface albedo scheme in HIRHAM-NAOSIM" – *Patrizia Schoch et al. (Leipzig University)*

#20 "Snow-age-dependent parameterization of snow density and conductivity for the use in climate models" – *Wolfgang Dorn et al. (AWI Potsdam)*

#21 "Characterizing dimensionless sea-ice heterogeneity parameters in the Arctic boundary layer" – *Ilga Staudinger et al. (University of Cologne)*

#22 "Constraints on Southern Ocean Mesoscale Cellular Convective Cell Growth" – *Anna Possner et al. (Goethe University of Franktfurt)*

Poster Session I – Aerosols, SQ1 & SQ2

#23 "Marine carbohydrates in Arctic aerosol particles – connections to oceanic emissions and in-situ processing" – *Manuela van Pinxteren et al. (TROPOS)*

#24 "In situ aerosol and turbulence observations in Antarctica during the SANAT campaign" – *Laura Köhler et al. (AWI Bremerhaven)*

#25 "Patterns and Long-Term Trends of Primary Marine Organic Aerosol in the Arctic" – *Bernd Heinold et al. (TROPOS)*

#26 "Tethered balloon-borne measurements for the characterization of the evolution of the Arctic atmospheric boundary layer at Station Nord" – *Henning Dorff et al. (Leipzig University)*

#27 "Validation of a Aerosol Optical Depth Retrieval over high albedo surfaces" – *Linus Andrae et al. (University of Bremen)*

#28 "Patterns and Trends of Arctic Aerosols from a Merged Dataset of Satellite Retrievals Across Different Surface Types" – *Neha Mehendale et al. (University of Bremen)*

#29 "Radiatively driven entrainment and turbulence forcing at Arctic cloud tops from 2D imaging and atmospheric profiling" – *Michael Schäfer et al. (Leipzig University)*

#30 "Cloud Regime Classification and Evolution during Arctic Cold Air Outbreaks" – *Marcus Klingebiel et al. (Leipzig University)*

#31 "Quantifying the influence of Barents-Kara sea ice loss on Ural blocking" – *Ernest Agyemang-Oko et al. (Leipzig University)*

#32 "Temperature and humidity trends from Ny-Ålesund balloon-borne measurements" – *Marion Maturilli et al. (AWI Potsdam)*

#33 "Balloon-borne observations and simulations of the transition phases in the wintertime Arctic atmospheric boundary layer at Station Nord, Greenland" – *Komal Navale et al. (TROPOS)*

#34 "Evaluating Reanalysis Snowfall Estimates in the Arctic using Flight Based Radar Observations" – *Awadhesh Pant et al. (University of Cologne)*

#35 "Macro- and Microphysical Properties of Atmospheric River Snowfall: Results from Two Instrument Sites" – *Jack Richter et al. (University of Michigan)*

#36 "Identifying drivers of the thermal-infrared radiative effect of Arctic low-level clouds in cold air outbreaks" – *Sophie Rosenburg et al. (Leipzig University)*

#37 "Extending the Surface Energy Budget View on Arctic Atmospheric Rivers: Climatological Classifications and Dependence on the Flavor" – *Sofie Tiedeck et al. (AWI Potsdam)*

#38 "A Ground and Satellite Based Characterization of Atmospheric River Impacts on Clouds and Precipitation in Greenland" – *Alanna Wedum et al. (University of Michigan)*

#39 " The changing role of convection in the Arctic" – *Sophie Vliegen et al. (Leipzig University)*

#40 "Evaluating Fog Forecasts in the Central Arctic Ocean Using AO2025 Observations" – *Luise Schulte et al. (University of Cologne)*

Presenters information

The time limits for session talks are as follows:
Keynote talks: 20 min + 10 min discussion,
Talks: 15 min + 5 min discussion.
All speakers are requested to submit their talk to the respective session chairs on the presentation laptop (PowerPoint or PDF) before the start of their session.

Poster information

Poster display boards are A0 size. The posters will be displayed on both sides and hung during both poster sessions. For logistical reasons, however, they will only be set up during the poster sessions.

Accommodation information

We have reserved hotel room units in the following 4 hotels via a contingent (please be aware of different booking conditions):

- **Motel One Köln Altstadt** (https://www.motel-one.com/de/hotels/koeln/hotel-koeln-altstadt/, Booking via koeln-altstadt@motel-one.com, Booking code: **"AC3 Conference 2026"**):
- 50 single rooms, € 95,00 per night, incl. breakfast, plus 5% city tax
- in Köln Südstadt, south of the city center, 20 min tram & walk distance to IGMK building, 10 min tram distance to Cologne cathedral
- rooms can be called up until 12 January 2026 at the latest using booking code "AC3 Conference 2026". Unused rooms will go back on sale after this date. Free cancellation period until 14 days before arrival.
- Check-in: 15:00, Check-out: 12:00. Credit card needed for booking.

- **ibis Köln Centrum** (https://all.accor.com/hotel/1449/index.de.shtml, Booking via H1449@accor.com, Booking code **"AC3 Conference 2026"**)
- 20 single rooms, € 95,00 per night, incl. breakfast, plus 3,90€ city tax
- close to Barbarossaplatz, 10 min tram distance to IGMK building, 10 min tram distance to Cologne cathedral
- rooms can be called up until 12 January 2026 at the latest using booking code "AC3 Conference 2026". Unused rooms will go back on sale after this date. Free cancellation period until 3 days before arrival.
- Check-in: 15:00, Check-out: 12:00. Credit card needed for booking.

- **nuno hotel** (www.nunohotel.com, Booking via mail@nunohotel.com, Booking code: **"AC3 Conference 2026"**)
- 30 single rooms, € 109,00 per night, incl. breakfast, plus 5% city tax
- directly at Barbarossaplatz, 10 min tram distance to IGMK building, 10 min tram distance to Cologne cathedral
- rooms can be called up until 23 January 2026 at the latest using booking code "AC3 Conference 2026". Unused rooms will go back on sale after this date. Free cancellation period until 10 days before arrival.
- Check-in: 15:00, Check-out: 11:00. Late Check-in possible with credit card.

- **B&B hotel Köln city** (https://www.hotel-bb.com/de/hotel/koeln-city, Booking via koeln-city@hotelbb.com, Booking code: **"AC3 Conference 2026")**
- 30 single rooms, € 89,00 per night, excl. breakfast (13,90€), plus 5% city tax
- west of Cologne city center, 30 min tram distance to IGMK building, 30 min tram distance to Cologne cathedral

- rooms can be called up until 25 January 2026 at the latest using booking code "AC3 Conference 2026". Unused rooms will go back on sale after this date. Free cancellation period until 4 weeks before arrival.
- Check-in: 15:00, Check-out: 11:00. Credit card needed for booking.